


METHOD FOR ASSEMBLING CONTROL UNIT OF VEHICLE

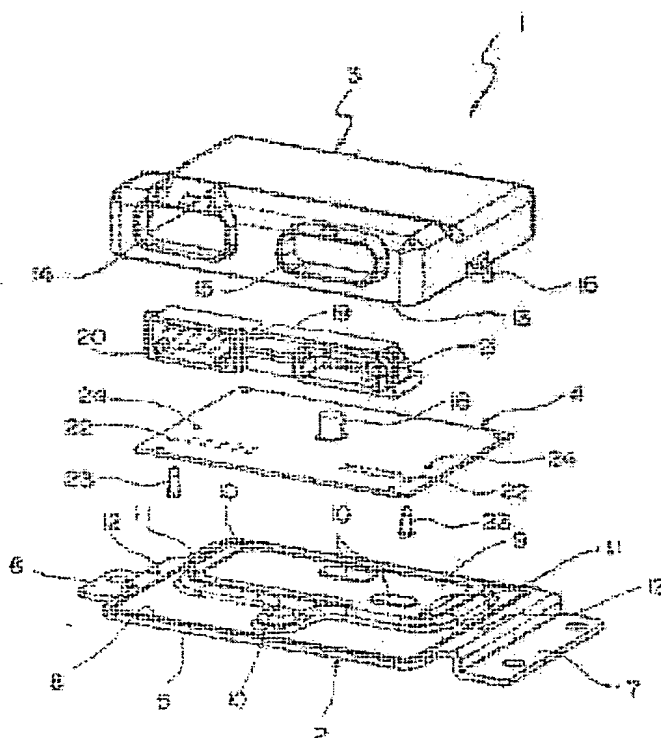
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Abstract of JP 2003198159 (A)

PROBLEM TO BE SOLVED: To provide a method for assembling a control unit of vehicle in which the assembling process is simplified. ; **SOLUTION:** The method for assembling a control unit of vehicle comprises a step for filling the groove 8 of a base 2 with adhesive and applying adhesive to a coating part, a step for mounting a circuit board 4 on a protruding part 9 while matching through holes 24 and 24 and positioning protrusions 11 and 11, and a step for fixing a cover 3 to the base 2 from above the circuit board 4 while matching temporary fixing protrusions 16 and 16 and round holes 12 and 12. In this regard, the circuit board 4 is pressed against the base 2 by the pressing protrusion 17 of the cover 3. The method further comprises a step for preventing the cover 3 from floating by welding the temporary fixing protrusions 16 and 16 inserted into the round holes 12 and 12 thereby fixing the cover 3 and the base 2 temporarily, and a step for eventually hardening the adhesive. ; **COPYRIGHT:** (C) 2003,JPO



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CLAIMS

[Claim(s)]

[Claim 1]An assembly method of a control unit for vehicles which is an assembly method of a control unit for vehicles constituted by having a base, covering, and the circuit board stored by these insides, and is characterized by assembling said base, said covering, and said circuit board by fixing with adhesives.

[Claim 2]An assembly method of a control unit for vehicles fixing said circuit board and said base with said adhesives in an assembly method of the control unit for vehicles according to claim 1 suppressing said circuit board at said base with said covering.

[Claim 3]An assembly method of a control unit for vehicles performing simultaneously said base, said covering, and immobilization by said adhesives of said circuit board in an assembly method of the control unit for vehicles according to claim 1 or 2.

[Claim 4]An assembly method of a control unit for vehicles greeting the completion of fixed of said adhesives in an assembly method of the control unit for vehicles according to claim 3 where temporary fastening of said base and said covering is carried out.

[Claim 5]An assembly method of a control unit for vehicles performing said temporary fastening in a position different from immobilization by said adhesives in an assembly method of the control unit for vehicles according to claim 3.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the assembly method of the control unit for vehicles constituted by having a base, covering, and the circuit board.

[0002]

[Description of the Prior Art]As this kind of an assembly method, after two or more places are fixed with a screw based on the circuit board, similarly covering is fixed to that base two or more places with a screw, and the assembly method which assembled the control unit for vehicles is generally adopted. Indication art, such as JP,2001-85858,A, is mentioned as a proposal relevant to this kind of fixing method.

[0003]

[Problem(s) to be Solved by the Invention]By the way, if it is in the above-mentioned conventional technology, sufficient consideration is not made about the simple nature of the assembly process concerning a base, the circuit board, and covering, but two or more screw fixation of the circuit board and a base and two or more screw fixation of covering and a base are making the assembly process complicate.

[0004]This invention is made in view of the situation mentioned above, and makes it SUBJECT to provide the assembly method of the control unit for vehicles excellent in simplification of an assembly process.

[0005]

[Means for Solving the Problem]It will be as follows if an outline of a typical thing is briefly explained among inventions indicated in this application.

[0006]That is, it was made to assemble by fixing a base, covering, and the circuit board with adhesives. It was made to perform a base, covering, and immobilization by adhesives of the circuit board simultaneously. Thereby, an assembly process of a control unit for vehicles can be simplified. A paragraph of the following embodiment explains a concrete flow concerning an assembly.

[0007]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings. Drawing 1 is an exploded perspective view of the control unit for vehicles in which the 1 embodiment of the assembly method of the control unit for vehicles of this invention is shown. The perspective view and drawing 6 to which drawing 4 of the decomposition sectional view of the control unit for vehicles and drawing 3 was visible to in the sectional view of the control unit for vehicles, and was visible to in the sectional view of the base, and the inside of covering was made visible [drawing 2 / drawing 5] are an inside figure of covering.

[0008]In drawing 1 thru/or drawing 3, the control units (ECU etc.) 1 for vehicles are provided with the circuit board 4 which is stored in the base 2 attached to a vehicle body etc., for example, the covering 3 fixed to the base 2, and these bases 2 and the covering 3, and is fixed to the base 2, and are constituted. The control unit 1 for vehicles is assembled by carrying out adhesion fixing of the base 2, the covering 3, and the base 2 and the circuit board 4 with the adhesives of a silicon system, respectively. First, each above-mentioned members forming is explained, referring to drawing 1 thru/or drawing 6.

[0009]The above-mentioned base 2 is provided with the following.

For example, it is an approximately tabular member which consists of aluminum (aluminum base), and is the base body 5 of a plane view rectangle.

The vehicles mounting legs 6 and 7 ganged by the both sides of the base body 5.

The slot 8 and the lobe 9 are formed in the base body 5, and two or more adhesive application part 10 and locatings lug 11 and 11 are formed in the lobe 9.

[0010]The slot 8 dents the surface of the base body 5, and is formed. The slot 8 is formed near the edge of the base body 5. The slot 8 is suitably filled up with the adhesives (un-illustrating) of quantity in the case of an assembly of the control unit 1 for vehicles. The lobe 9 dents the rear face of the base body 5, it is formed by making the surface of the opposite hand project, and two or more adhesive application parts 10 are formed in the upper surface of the lobe 9. The adhesives (un-illustrating) of quantity are suitably applied to the adhesive application part 10 in the case of an assembly of the control unit 1 for vehicles. The locatings lug 11 and 11 are the portions of the pin shape for positioning the circuit board 4, and are formed in the proper position on the field of the adhesive application part 10.

[0011]The round holes 12 and 12 penetrated in the direction of a surface and rear surface of the base body 5 are formed in the consecutive part of the base body 5 and the vehicles mounting legs 6 and 7. The round holes 12 and 12 are used when carrying out temporary fastening of the covering 3.

[0012]The above-mentioned covering 3 is a product made of a synthetic resin, for example, and is formed in the box shape from which the base 2 side is released. The projection 13 is formed at the tip of the side attachment wall which constitutes the covering 3 over the perimeter. The connector housing 14 and 15 is formed in the side attachment wall by the side of a transverse plane. The projections 16 and 16 for temporary fastening are formed in the side attachment wall of both sides.

[0013]It has come to put the projection 13 in the slot 8 of the base body 5 in the case of an assembly of the control unit 1 for vehicles. The connector housing 14 and 15 is formed in connector joints with the connector which is not illustrated. The projections 16 and 16 for temporary fastening are used in the case of temporary fastening with the base 2.

[0014]On the other hand, two or more projections 17 for forcing are formed in the inner surface of the ceiling wall which constitutes the covering 3. The projection 17 for forcing is a cylindrical portion which has sufficient length, and can force the circuit board 4 now to the base 2 in the case of an assembly of the control unit 1 for vehicles.

[0015]Two or more circuits which are cabled by a desired pattern and which are not illustrated are formed in the above-mentioned circuit board 4. The electronic parts 18 and the substrate connector 19 of plurality (even a capacitor is accepted and illustrated) are carried in the surface of the circuit board 4. In this gestalt, attachment of parts shall not be made in the rear face of the circuit board 4 (since on the back [a part of] turns into an adhesion side).

[0016]The substrate connector 19 is provided with the two connector areas 20 and 21 which engage with the connector housing 14 and 15 of the covering 3 in the state with airtightness, and is constituted. The substrate connector 19 is being fixed with the bolts 23 and 23 for connector immobilization via the breakthroughs 22 and 22 formed in the circuit board 4. In this gestalt, the breakthroughs 24 and 24 for positioning are formed near the breakthroughs 22 and 22. The breakthroughs 24 and 24 are formed corresponding to the position of the locatings lug 11 and 11 of the base 2.

[0017]Next, the assembly process of the control unit 1 for vehicles is explained. In the above-mentioned composition, the process of filling up with or applying adhesives (un-illustrating) in the first place at the slot 8 and the adhesive application part 10 of the base 2 is performed. And the process of carrying the circuit board 4 on the lobe 9 as the breakthroughs 24 and 24 and the locatings lug 11 and 11 are doubled [second] is performed. The process of attaching the covering 3 to the base 2 from on the base 2 and the circuit board 4 as the projections 16 and 16 for temporary fastening and the round holes 12 and 12 are doubled with the third is performed. The circuit board 4 is forced on the base 2 by the projection 17 for forcing of the covering 3 at this time. And the process of welding the projections 16 and 16 for temporary fastening put [fourth] in the round holes 12 and 12, carrying out temporary fastening of the covering 3 and the base 2, and stopping the relief of the covering 3 is performed, and the process over hardening of adhesives (un-illustrating) is performed at the last. Thereby, a series of assembly processes are completed.

[0018]As mentioned above, the control unit 1 for vehicles is assembled by fixing the base 2, the covering 3, and the circuit board 4 with adhesives (un-illustrating). As the control unit 1 for vehicles performs simultaneously the base 2, the covering 3, and immobilization by the adhesives (un-illustrating) of the circuit board 4, it is assembled. Therefore, since [like before] the process of two or more screw fixation is made unnecessary and airtightness sufficient moreover is also acquired, an assembly process can be simplified conventionally.

[0019]The result that the assembly which had taken for 6 to 7 minutes conventionally becomes in 3 minutes has been obtained. It cannot be overemphasized that forcing and the above-mentioned temporary fastening of the circuit board 4 by the projection 17 for forcing have contributed to simplification of an assembly process.

[0020]In addition, the range into which this invention does not change the main point of this invention – various – change – the feasible thing is natural. That is, the above-mentioned temporary fastening shall not be welding (for example, the hole with which a lock arm and its lock arm engage is mentioned). The position of the above-mentioned temporary fastening shall not be the above-mentioned position (when airtight consideration is unnecessary, it may be made to carry out by the inside of the slot 8).

[0021]

[Effect of the Invention]As explained above, the effect that the assembly method of the control unit for vehicles excellent in simplification of an assembly process can be provided is done so.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is an exploded perspective view of the control unit for vehicles in which the 1 embodiment of the assembly method of the control unit for vehicles by this invention is shown.

[Drawing 2]It is a decomposition sectional view of the control unit for vehicles.

[Drawing 3]It is a sectional view of the control unit for vehicles.

[Drawing 4]It is a sectional view of a base.

[Drawing 5]It is the perspective view the inside of covering was made visible [perspective view].

[Drawing 6]It is an inside figure of covering.

[Description of Notations]

- 1 The control unit for vehicles
- 2 Base
- 3 Covering
- 4 Circuit board
- 5 Base body
- 6 and 7 Vehicles mounting leg
- 8 Slot
- 9 Lobe
- 10 Adhesive application part
- 11 Locating lug
- 12 Round hole
- 13 Projection
- 14 and 15 Connector housing
- 16 The projection for temporary fastening
- 17 The projection for forcing
- 18 Electronic parts
- 19 Substrate connector
- 20, 21 connector areas
- 22 and 24 Breakthrough
- 23 The bolt for connector immobilization

[Translation done.]

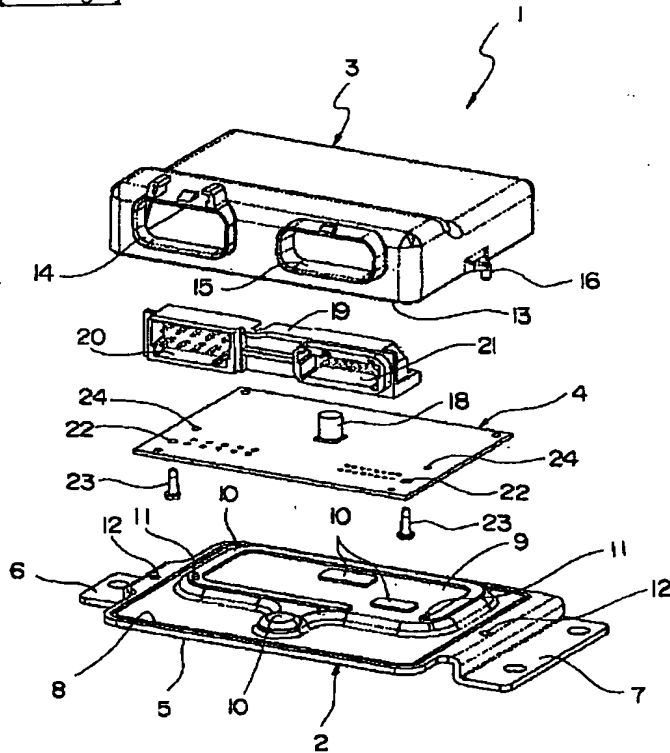
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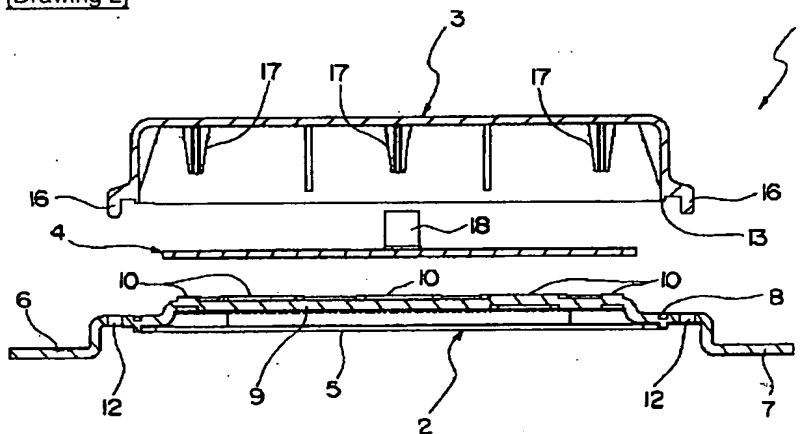
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DRAWINGS

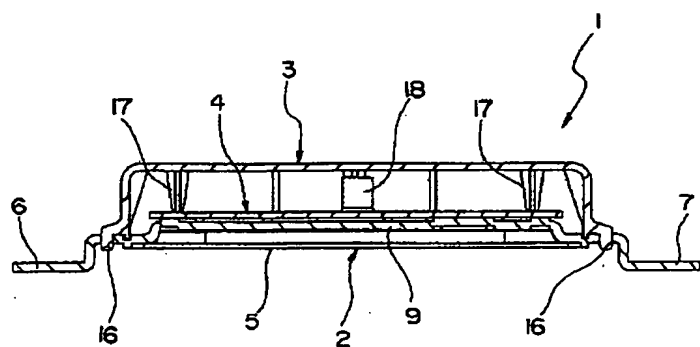
[Drawing 1]



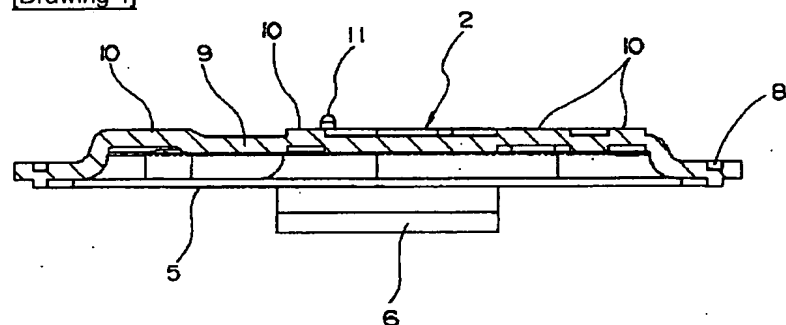
[Drawing 2]



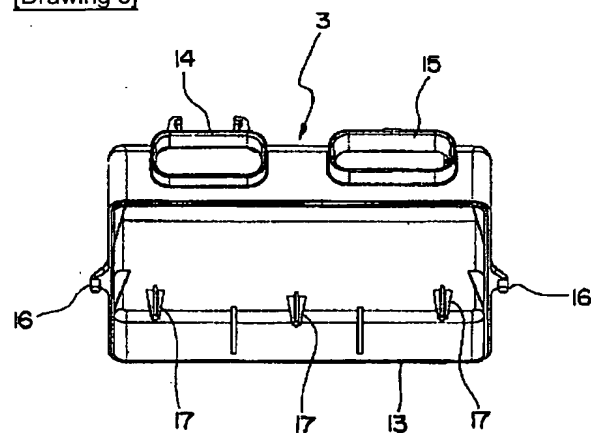
[Drawing 3]



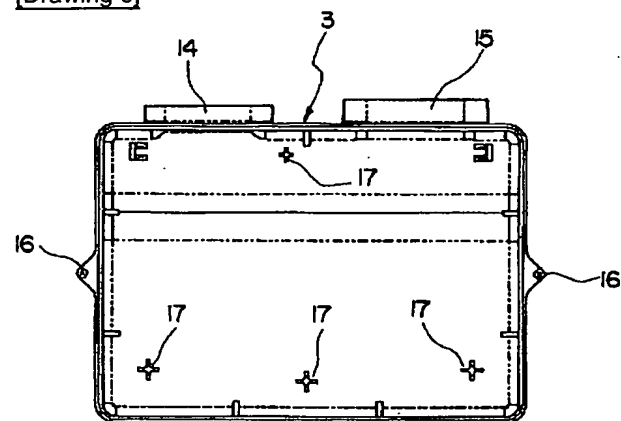
[Drawing 4]



[Drawing 5]



[Drawing 6]



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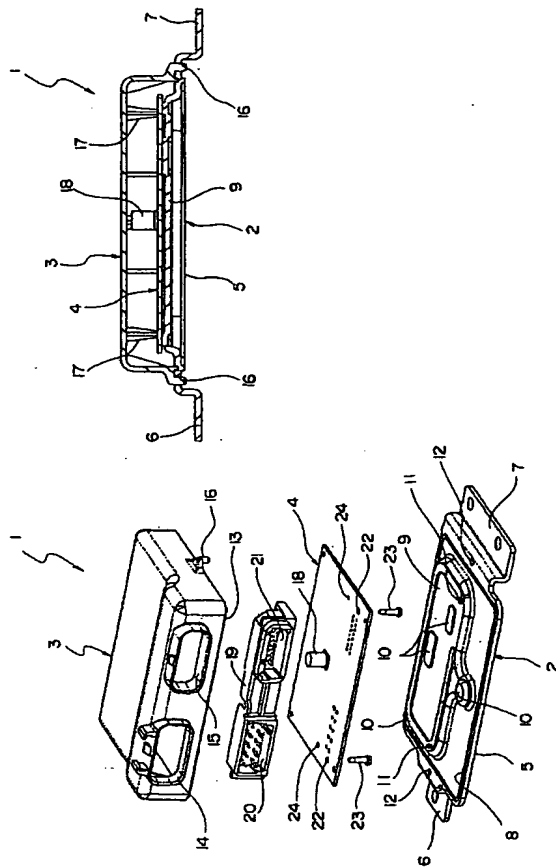
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- 11 位置決め突起
12 丸穴
13 突起
14、15 コネクタハウジング
16 仮固定用突起
17 押し付け用突起

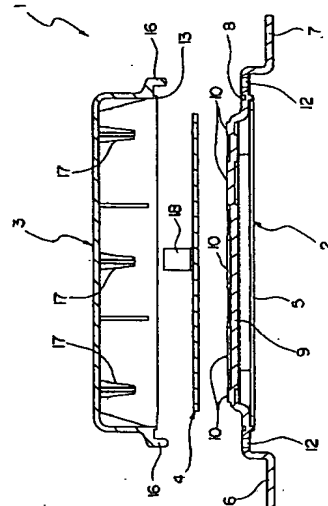
- 18 電子部品
19 基板コネクタ
20、21 コネクタ部
22、24 貫通孔
23 コネクタ固定用ボルト

【図1】

【図3】



【図2】



【0011】ベース本体5と車両取付脚部6、7との接続部分には、ベース本体5の設置面方向に貫通する丸穴12、12が形成されている。その丸穴12、12は、カバー3を仮固定する際に使用されるようになっている。

【0012】上記カバー3は、例えば合成樹脂製であって、ベース2側が解放される箱形状に形成されている。カバー3を構成する側壁の先端には、突起13が全周にわたって形成されている。また、正面側の側壁には、コネクタハウジング14、15が形成されている。さらに、両側の側壁には、仮固定用突起16、16が形成されている。

【0013】突起13は、車両用制御ユニット1の組み立ての際に、ベース本体5の溝8に押し込まれるようになっている。コネクタハウジング14、15は、図示しないコネクタとのコネクタ接続用に形成されている。仮固定用突起16、16は、ベース2との仮固定の際に使用されるようになっている。

【0014】一方、カバー3を構成する天井壁の内面には、複数の押し付け用突起17が形成されている。その押し付け用突起17は、十分な長さを有する棒状の部分であって、車両用制御ユニット1の組み立ての際に、回路基板4をベース2に対して押し付けることができるようになっている。

【0015】上記回路基板4には、所望のパターンで配線される図示しない回路が複数形成されている。また、回路基板4の表面には、複数のコンデンサ等（図示）の電子部品18と基板コネクタ19とが搭載されている。尚、本形態において、回路基板4の裏面には、部品の取り付けがなされていないものとする（裏面の一部が接合面になるため）。

【0016】基板コネクタ19は、カバー3のコネクタハウジング14、15に気密性を有した状態で嵌合する二つのコネクタ部20、21を備えて構成されている。また、基板コネクタ19は、回路基板4に形成された貫通孔22、22を介してコネクタ固定用ボルト23、23により固定されている。本形態において、貫通孔22、22の近傍には、位置決め用の貫通孔24、24が形成されている。その貫通孔24、24は、ベース2の位置決め突起11、11の位置に対応して形成されている。

【0017】次に、車両用制御ユニット1の組立工程について説明する。上記構成において、第一にベース2の溝8及び接続刺さる部10に接合刺（不図示）を充填又は塗布する工程を行う。そして、第二に貫通孔24、24と位置決め突起11、11とを合わせるようにして回路基板4を突出部9上に載せる工程を行い、第三に仮固定用突起16、16と丸穴12、12とを合わせるようにしてカバー3をベース2及び回路基板4の上からベース2に組み付ける工程を行う。尚、この時、カバー3

の押し付け用突起17によって回路基板4がベース2に押し付けられる。そして、第四に丸穴12、12に挿し込まれた仮固定用突起16、16を溶着してカバー3とベース2とを仮固定しカバー3の浮き上がりを抑える工程を行い、最後に接合刺（不図示）の硬化に対する工程を行う。これにより一連の組立工程が完了する。

【0018】以上、車両用制御ユニット1は、ベース2、カバー3、及び回路基板4を接合刺（不図示）で固定することにより組み立てられる。また、車両用制御ユニット1は、ベース2、カバー3、及び回路基板4の接合刺（不図示）による固定を同時に行うようにして組み立てられる。従って、従来のような複数箇所のネジ固定の工程を不要にし、なおかつ十分な気密性も得られることから、組立工程を従来よりも簡略化することができ

る。

【0019】尚、従来6〜7分間かかっていた組み立てが3分になるという結果を得ている。押し付け用突起17による回路基板4の押し付けや上記固定が組立工程の簡略化に寄与しているのは言うまでもない。

【0020】その他、本発明は本発明の主旨を要する範囲で種々変更実施可能なことは勿論である。すなわち、上記固定は溶着でなくともよいものとする（例えばロックアームとそのロックアームに係合する孔とが準ててもよいものとする（気密性の考慮が不要の場合には、溝8の内側で行うようにしてもよい）。

【0021】

【発明の効果】以上説明したように、組立工程の簡略化に俟れた車両用制御ユニットの組立方法を提供することができるといふ効果を奏する。

【図面の簡単な説明】

【図1】本発明による車両用制御ユニットの組立方法の一実施の形態を示す車両用制御ユニットの分解斜視図である。

【図2】車両用制御ユニットの分解断面図である。

【図3】車両用制御ユニットの断面図である。

【図4】ベースの断面図である。

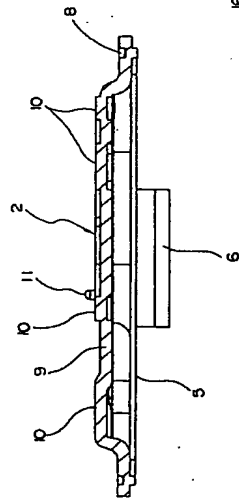
【図5】カバーの内側を見えるようにした斜視図である。

【図6】カバーの内側図である。

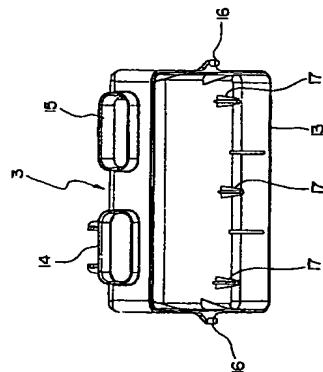
【符号の説明】

- 1 車両用制御ユニット
2 ベース
3 カバー
4 回路基板
5 ベース本体
6、7 車両取付脚部
8 溝
9 突出部
10 接合刺さる部

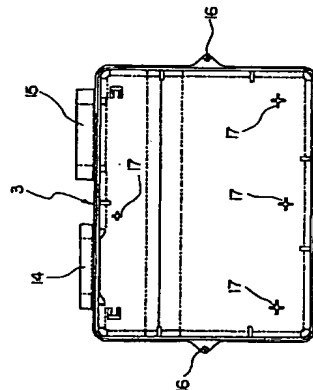
【図4】



【図5】



【図6】



フロントページの続き

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CC20 DD11 DR04 DR08 DR45
DR49 DR55 GG20